WINTER STORM ACTION PLAN

self storage property risk management guide

sage

because your business shouldn't freeze whenever the air does...

know them before you need them

FIRE DEPT PHONE

POLICE DEPT PHONE

INSURANCE AGENT PHONE

BUILDING OWNER PHONE

HVAC CONTRACTOR PHONE

ELECTRICIAN PHONE

PLUMBER PHONE

OTHER

Let's face it- mother nature isn't always very motherly. Unpredictable weather can mean unexpected and disastrous damage for self storage facility owners and tenants alike. Therefore, it's imperative to have a crisis management plan in place to protect your facilities, employees, clients and business reputation. Your response, under the stressful circumstances will speak the most to your character and business ethic.

Winter storms can cause severe damage, leaving those affected to lose business, inventory, property and lives. Recently, winter storms have proven to affect, not only Northern climates, but also result in freezing pipes and snow collapses in many Southern states. It is best to be as prepared as possible, in the event that substantial winter storms threaten you business and your employees.

pre-winter storm preparation

STEP 1: SECURE SUPPLIES + INFORMATION

Gather all emergency supplies, making sure that they are readily accessible to your on-site team. Set aside cash for post-storm needs, such as buying food + supplies, or paying employees and contractors.

winter storm emergency kit

- **snow removal**: rock salt, ice melt, sand + snow shovels
- **first aid kit**: over-the-counter painkillers, bandages, rubbing alcohol, eye rinse + burn kits, vomit-inducing medicine (for poisoning)
- **emergency lighting**: flashlights + extra batteries
- **more batteries**: you never know what you might need them for
- **shelter**: plastic covers and tarps, lumber, plywood + nails to board up windows/doors
- **nourishment**: drinking water, non-perishable food + can opener (3-day supply)
- **whistles**: to signal or direct attention during hurricane
- **communication**: battery-powered radio, walkie-talkies, cell phones + spare batteries
- **warmth**: heavy or heated blankets + extra clothing
- **miscellaneous**: portable pumps, hoses, and hand or power tools
- **backups**: have all vital business records + contacts backed up off-site

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STEP 2: INSPECTION + FORTIFICATION OF FACILITY

To prepare the actual facility for a winter storm, check the following items. They will minimize further damage and help you stay up and running during after a disaster.

- **update**: update your emergency response program to include appropriate response procedures for winter emergencies
- **supply kit**: add rock salt or ice melt, sand, and snow shovels to your disaster supply kit
- **appoint**: designate a person who will be responsible for snow/ice removal from driveways, doorways, and roofs
- **access**: determine alternate routes to the premises if snow and/or ice prohibit access from primary entrance
- **hydrants**: mark hydrants near your business to make them easy to locate in snow as it piles up
- **removal**: remove loose yard debris
- **relocate**: relocate yard storage of raw/finished goods, as well as, nonessential yard equipment (furniture, portable planters, signage, dumpsters, etc) to a safe, indoor location
- **flammable**: secure yard storage of flammable liquids drums or move them to a safe location away from important buildings
- **anchor**: anchor all portable buildings and trailers to the ground
- **scaffolds**: secure scaffolds and cranes. secure scaffolds to the building. fasten rail crane chassis to track with bolts and clamps
- **signage**: brace all outdoor signage

mid-storm procedures

STEP 1: IMMEDIATE ACTIONS

- **shut down**: shut down all non-critical and non-essential electrical equipment
- **clear**: keep driveways, walkways, doorways, and roof access points clear of snow and ice
- **patrol**: patrol the property when safe, to watch for leaks, pipe breakage, fire, or structural damage
- **electricity**: during power failure, turn off electrical switches to prevent re-energizing of equipment until necessary checks are completed
- **information:** stay informed by listening to local news/weather channels for situation developments and road closures
- **safety:** ensure employee & customer safety. if backup supplies are needed, don't use electric generators indoors, inside a garage or near building air intakes- avoid risk of carbon monoxide
- **gasoline:** do not store gasoline indoors where fumes could ignite
- **cords:** use individual heavy-duty, outdoor-rated cords to plug in other appliances

freeze-ups

DURING SEVERE COLD SPELLS, WATER IN SPRINKLER SYSTEM PIPING, DOMESTIC WATER SYSTEMS, HVAC OR PROCESS EQUIPMENT CAN FREEZE & EXPAND CAUSING PIPES OR FITTINGS TO BURST

Water damage from this type of incident can be expensive, especially if the water continues to flow for an extended period. Total costs of the damage and business interruption can be substantial.

In deep freeze conditions, a broken window or open door can let in enough cold air to freeze nearby water pipes and start a catastrophic chain of events. Additionally, any equipment that contains or uses water, produces condensation, or depends on pneumatic controls is vulnerable to freezing. Other conditions that make your business susceptible to freeze-ups are heating systems that lack reverse capacity beyond their normal heating load, inadequate building insulation and piping that runs through unheated areas or concealed spaces.

Many businesses find themselves unprepared when normal winter weather suddenly turns extreme, which can happen unexpededly fast. Being prepared means understanding the causes, effects and risk loss potential of freezing temperatures and winter storms. The following steps will help you implement preventative measures to better protect your business from freeze-ups.

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STEP 1: BEFORE COLD WEATHER SEASON

- **appoint**: appoint one or more members to an emergency response team, to monitor weather forecasts & initiate winter emergency procedures when necessary
- **procedures**: develop procedures to be followed if you lose heat or electricity (including those for restoring electrical services item-by-item
- **evalute**: determine which processes depend on continued building heat for safety (subject to solidification or runaway reactions)
- **identify**: identify which equipment, process and piping that contain or use water or other liquids that could freeze, and take measures to prevent potential damage during cold spells (drain any idle equipment, drain condensation frequently, provide adequate heat or protect with suitable antifreeze, or install electrical heat tracing and insulation)
- **monitor**: identify building areas that are unusually difficult to heat, or that lose heat quickly, and install a thermometer to monitor temperatures during cold spells. For unattended areas, install low-temperature detectors that can be monitored from a central location
- **protect**: protect water-filled sprinkler pipes that pass through open areas, cold rooms or areas exposed to temperatures below 40°F against freezing, by insulating coverings, frost-proof casings, or listed tracing systems
- **openings**: make sure windows, skylights, doors, ventilators, unused attics, stair towers, roof houses, low spaces under building or any other openings/closing do not expose water-filled piping to freezing
- **service**: regularly service heating systems
- **alternate fuel**: make sure adequate supplies of alternate fuels are on hand if the heating systems are capable of dual fuel firing
- **maintain**: inspect and maintain the building exterior to minimize openings. Fix windows and doors so they close tightly. Caulk, insulate and apply weather stripping as needed. Close and seal unneeded dampers, louvers, vents and openings. Inspect roof drains for debris
- **condensation**: drain condensation from dry pipe sprinkler system piping by opening the priming water level drain valve until the water has been expelled. Also, make sure auxiliary drains installed at the system's low points are regularly checked and drained
- **test**: maintain and test standby electric generators for emergency power. determine if portable heaters or equipment are needed

know the facts

the **coldest** recorded temperature in the U.S. was **-80° Fahrenheit** in Prospect Creek, Alaska on January 23, 1971.

the **furthest south** snow has ever fallen in the U.S. was in Homestead, Florida in January 1977.

the **fastest drop** in temp was a **49 degree** plummet in **15 minutes**, in Rapid City, South Dakota in January 1911.

STEP 2: DURING COLD SPELLS

- **monitor**: monitor temperatures every few hours in vulnerable areas by conducting regular watch tours or by checking low-temp alarms connected to constantly attended areas. constantly monitor any boilers or other heating systems that must remain online
- **sprinklers**: check that water-filled sprinkler piping is maintained at 40°F minimum temp
- **heaters**: provide portable heaters for areas that might fall below 40°F., and heat or steam tracing for exterior piping containing liquids subject to freezing
- **windbreak**: use tarps to create temporary windbreaks. For permanent windbreaks, consider planting evergreen trees and hedges upwind from vulnerable buildings
- **faucets**: for vulnerable pipes, open water faucets slightly to let them drip and keep water flowing. ice may still form but the open faucet helps prevent the pipe from bursting by allowing relief for any built up pressure
- **repair**: if pipes freeze, turn off water supply and thaw or repair damaged piping. do not use open flame devices to thaw frozen pipes or equipment
- **protection**: verify all fire protection equipment is in service. keep names and numbers of fire dept, heating contractor, plumber on hand

snow loading & roof collapse

MOST BUSINESSES PLAN FOR SNOW BY WINTERIZING VEHICLES OR CONTRACTING SNOWPLOWING, BUT NEGLECT TO ADEQUATELY PLAN FOR EXCESSIVE SNOW LOADING ON ROOFS.

The potential for roof collapse/structural damage increases as the weight of accumulated snow and ice exceeds the snow load capacity of th roof.

Rain falling on accumulated snow is especially dangerous because snow-covered roofs do not drain well and accumulating water and ice can quickly exceed the design limits of the roof.

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Even if you are in a warm area of the country, you should not ignore this hazard. In fact, your facilities may be more susceptible to an unusually sever winter storm because they are not designed for extreme weather and personnel are less accustomed to, and less prepared for extreme conditions. In addition, building codes in these areas have lower snow load requirements that can make roofs more susceptible to collapse from unusual snow loading.

Planning, preparation & prompt action to remove accumulated snow can help minimize potential risk of roof collapse.

STEP 1: PLANNING & PREPARATION

- **review**: be sure your emergency response program covers winter emergencies and includes procedures for excessive snow loads
- **load limit**: determine maximum safe snow depth for your roof based on its load capacity as indicated in the building plans
- **reinforce**: for new construction or when reinforcing roof load limits, follow design guidelines in American Society of Civil Engineers Standard for Minimum Design Loads for Buildings and Other Structures, ASCE 7
- **inspect**: inspect the roof structure for damage or deterioration and repair as needed. Inspect all roof drains and downspouts, clean any accumulated debris from the roof to prevent clogging the drainage system. look for evidence of past water ponding, eliminate the cause
- **removal**: identify who is responsible for snow/ice removal from roofs. Establish a plan for elevating mechanized snow removal equipment to the roof. determine what special tools, equipment, protective devices, clothing/footwear will be needed to work on a snow covered roof. Make sure all necessary gear is on handy and ready to use. Determine what types of fall protection will be needed to work on a snow covered roof. Guradrails, nets, or personal fall-arrest system for each worker may be necessary depending on roof configuration
- **hazards**: determine if there are any special hazards on the roof that may be hidden from view by snow. Mark skylights, roof drains, vents and other hazards or obstructions so that workers will be able to see and avoid them
- **plan**: develop a plan for keeping all roof access points clear of snow. develop a plan to ensure that powered equipment is not used within 10 feet of any roof edge
- **teach**: teach workers the warning signs of overexposure and hypothermia. instruct workers on snow covered roofs to operate equipment at reduced speed due to slippery roof conditions
- **study**: read and study and follow all manufacturers' instructions for the safe use of snow blowers and similar mechanical equipment
- **consult**: check with a roofing contractor before using mechanized equipment on a the roof to ensure it will not damage roof membrane

STEP 2: WHEN THE SNOW FLIES- SAFE REMOVAL

Regularly monitor snow depth on the roof, paying close attention to areas where snow tends to drift and accumulate. Ares such as roof valleys (low sections adjacent to higher sections) and roof-mounted structures, such as tanks and penthouses, are particularly susceptible.

Remove snow accumulations from the roof before the snow reaches 50% of the safe maximum depth (see Table) and use safe roof practices. Do not send employees on to the roof once the snow load approaches the load capacity. Remove snow during a storm only if the forecast indicates that the total snowfall will result in dangerous accumulations.

Remove snow in layers uniformly across the roof to prevent unbalanced loads that might cause collapse. Avoid making snow piles on the roof during the removal process.

Clear snow and ice from storm drains and catch basins. Periodically inspect the roof drainage system to make sure that it is not clogged with ice or debris.

Use care with snow removal equipment (shovels, ice spades, snow blowers, etc) to prevent roof cover damage. It's not necessary to clean completely down to roof surface as long as melting snow/water can freely flow to the drains.

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STEP 3: MEASURING THE SNOW LOAD

The following tables are a guide that combines live load design (lbs/ft^2) and the density (lbs/ft^3) of accumulating snow, ice or water to determine when to take corrective action. For example, a roof designed to handle a snow load of 20 lb/ft^2 could possibly withstand 11.5 inches of heavy, wet snow. Therefore, you should remove it from the roof (if it is safe to do so) when it reaches approximately 6 inches.

density information

	LIGHT/DRY SNOW	HEAVY/WET SNOW	ICE	WATER
DENSITY (LB/FT^3)	3.12	20/81	57.25	62.43
% OF WATER WEIGHT	5%	33%	92%	100%

equivalent inches of precipitation

	LIGHT/DRY SNOW		HEAVY/WET SNOW		ICE		WATER
DESIGN LOAD	depth	clear roof at	depth	clear roof at	depth	clear roof at	depth
5 lb/ft^2	19.2	10	2.9	1.5	1.0	0.5	1.0
10 lb/ft^2	38.4	19	5.8	3	2.1	1.0	1.9
15 lb/ft^2	57.7	28	8.6	4	3.1	1.5	2.9
20 lb/ft^2	76.9	38	11.5	6	4.2	2.0	3.8
25 lb/ft^2	96.1	48	14.4	7	5.2	2.5	4.8

post-storm procedures

STEP 1: IMMEDIATE ACTIONS

- **assess**: following the storm, assess damage and notify all critical people (management, contractors, etc) of next steps
- **secure**: secure the site and provide watch service if necessary
- **clear**: clear away snow and ice from driveways, walkways, doorways and roof access points
- **check**: check to make sure heating systems and water pipes are working
- **faucets**: close water faucets (if previously opened to prevent pipe from bursting)
- **cover**: cover broken windows and torn roof coverings immediately if damaged during the storm
- **separate**: separate any damaged goods
- **roof**: clean roof drains and remove snow, ice and debris from roofs

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post-storm procedures (continued)

- **temperature**: make regular temperature and wind chill checks to prevent workers from overexposure to the cold
- **rotate**: rotate workers to reduce their individual exposure to cold and prevent back injuries from shoveling snow
- re-energize: visually check for open bus bars, conductors and exposed insulators before re-energizing electrical systems
- **spoilage**: if you experienced power failure, check refrigerated items for spoilage, limit access to freezers and refrigerated areas during periods of interrupted electrical service to maintain temperatures as long as possible
- **hazards:** look for safety hazards such as live electrical wires, leaking gas, flammable liquids, corrosive/toxic materials and damage to foundations or underground piping
- **repair:** repair automatic sprinkler protection and/or water supplies to get protection back in service as soon as possible (if necessary)
- **test:** conduct 2 inch-main drain and alarm tests on automatic fire protection sprinkler systems to verify public water supply availability

winter storm information

IMPORTANT TERMS

winter storm watch : conditions are favorable for heavy snow, blizzard conditions or accumulations of freezing rain or sleet within the next 12 to 36 hours

winter storm warning : potentially life-threatening winter weather conditions are occurring or imminent- 2 of the following conditions may soon occur: heavy snow, freezing rain, sleet and/or heavy winds

winter storm advisory : hazardous winter weather conditions are happening, about to happen or are likely. If precautions aren't taken you may be either terribly inconvenienced or face risk of damage to property or loss of life. conditions include 2 or more of the following: snow, drizzle (or freezing rain), sleet and or blowing snow

wind chill warning : issued when extreme wind chills of -30 degrees Fahrenheit or less are occurring or likely to

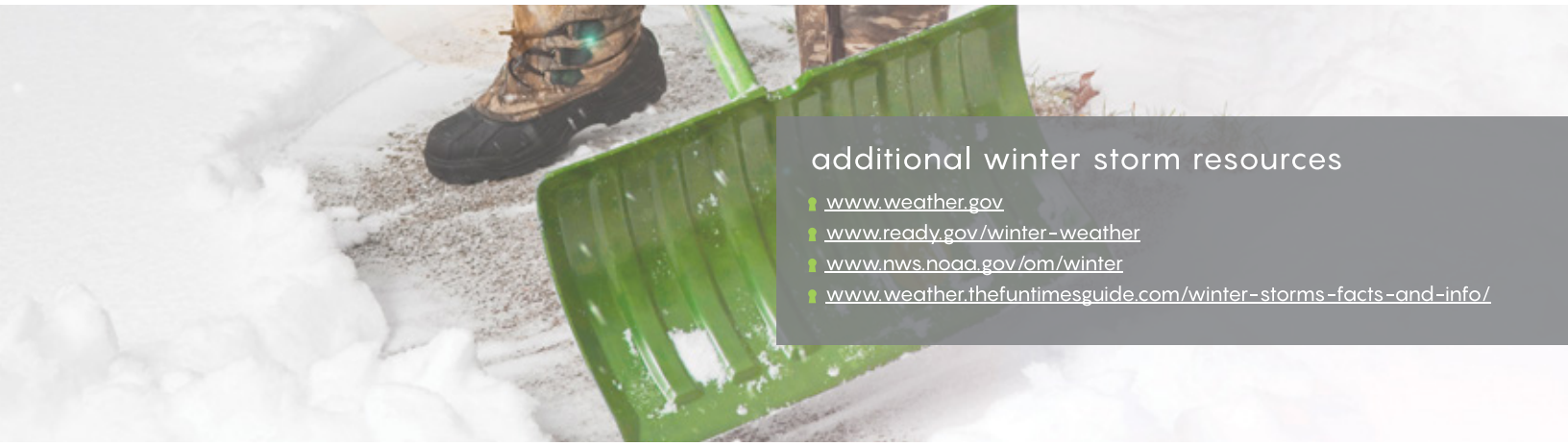
wind chill advisory : declared when wind chills of -20 degrees Fahrenheit or colder are occurring or likely to

freezing rain : rain that freezes when it hits the ground, creating a layer of ice on the roads, walkways, trees, etc.

sleet : rain that turns to ice before reaching the ground, where it bounces upon impact

snow squal : brief, intense snow showers accompanied by strong, gusty winds

blizzard : a dangerous combination of blowing snow and wind, with low visibility. heavy snowfall often accompanies, but does't define blizzards; strong winds sometimes pick up and blow snow that has already fallen



additional winter storm resources

- www.weather.gov
- www.ready.gov/winter-weather
- www.nws.noaa.gov/om/winter
- www.weather.thefuntimesguide.com/winter-storms-facts-and-info/